Web Application for e-commerce Using Django Framework

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ABSTRACT

It's crucial to be able to respond to client requests in the most efficient and timely way possible in the rapidly evolving business climate of today. If clients want immediate access to your goods or services and to view your company online. The acceptance and use of e-commerce as a business paradigm is rapidly growing. A growing number of companies are putting in place websites that offer the ability to conduct business online. Online shopping is getting more and more common, it is fair to assume. We now live in a world where these kinds of internet stores are commonplace. By digitizing the information, companies can save money on the costs associated with its creation, processing, distribution, retrieval, and management. E-commerce stores' primary function is to allow customers to purchase goods online while relaxing in their homes.

KEYWORDS: E-commerce, Django, Virtual Environment, online transaction, IDE

1. INTRODUCTION

Modern Web applications have developed into sophisticated distributed apps today. The globalization of the internet has significantly altered how people trade and do business. Modern web apps have evolved into sophisticated distributed applications as a result.

Electronic commerce, also known as e-commerce, is the exchange of products and services as well as the transmission of money and data via an electronic network, most commonly the internet. These business dealings can be between businesses, between consumers, between consumers and businesses, or between consumers and businesses. Although the concept of electronic commerce (or "e-commerce") is relatively recent, businesses increasingly routinely transact business online. Additionally, it employs routine technological upkeep to guarantee the efficient operation of online storefronts, financial transactions, and everything else related to offering and delivering goods. It can be simply defined as buying and selling goods online. Online shopping is typically connected with this term. Here, we're going to create an application for online shopping as this sector of the economy is growing more and more competitive and has permeated people's daily lives.

2. LITERATURE REVIEW

A. Django: Web Development Simple & Fast

Himanshu Gore et al., Python-based web application framework called Django is free and open source. Model View Template, or MVT, is the design structure that is employed. because of its trait of quick development. In the current market, Django is really demanding. Any type of application can be created more quickly. We call this framework "Model View Template" because it will function as a user-side for communication and interaction while using the model as a database and the view as a controlling feature. Two key commands are used to manage the Django model's database: - python manage.py make migrations The model updates will be subtracted by Django.py file is prepared to transfer data to sqlite3 (or any other database). Then we run migrate in Python manage.py. then all changes will be saved by the Django system in his database system. After that, we add the line Python manage.py run server at the end, which will launch our project and provide the localhost address for the locally running app. And views. The project's request to the API for template management in requests will be handled by the py file. The views can be written as Python functions.

B. The Benefits and Challenges of Electronic Commerce in an Emerging Economy

Abdul Gaffar Khan et al., In an expanding country like Bangladesh, information technology has become increasingly important to the future growth of the financial sectors and commercial practices. In order to decrease fraudulent activities, there is a greater need to pay attention to e-commerce security due to the increased usage of smart mobile services and the internet as a new distribution channel for corporate transactions and international trade. There have been significant changes in all aspects of daily life for humans as a result of the development of information and communication technology. E-commerce has many advantages that increase customer satisfaction in terms of consumer convenience wherever they are and give the business a competitive edge over rivals. According to this analysis, rising economies would face some difficulties.

C. A Study on impact of E-Commerce on India's commerce

Dr. Rajasekar. S et al., A transaction is made online in e-commerce. E-commerce offers customers numerous advantages, such as lower prices, a broader selection, and time savings. E-finance and E-merchandise are the two subcategories of ecommerce in general. In India, a large number of businesses, groups, and communities use both e-commerce and mobile commerce to conduct business. In India, ecommerce is experiencing phenomenal business growth. Increased internet usage has contributed to its expansion. E-commerce penetration is low compared to markets like the United States (266 M, 84%) or France (54 M, 81%), despite having the second-largest user base in the world, only behind China (650 M, 48% of population), but is growing at an unprecedented rate, adding about 6 M new entrants every month. According to industry agreement, growth is about to turn. The value of the Indian e-commerce market increased from $3.9 billion in 2009 to $12.6 billion in 2013. The value of the e-retail market in 2013 was $2.3 billion. The travel sector makes up over 70% of India's online retail business. In 2014, there were 35 million online shoppers in India, according to Google India. India is anticipated to produce $100 billion in online retail sales by 2020, of which $35 billion would come from the estimated four-fold increase in garment sales. This report is the result of an analysis of several research studies on the impact of e-commerce on Indian.

D. Django Based Web Application to Empower Skilled People

Afroj Satwilkar et al., The building of web applications using Django is the main topic of this paper. A cutting-edge Python web framework called Django has revolutionized web development in the Python community. Its success can be attributed to a complete stack strategy, practical design, and excellent documentation, among other things. Django is a free and open-source Python web framework that speeds up and enjoys online design. Model-View Controller (MVC) architecture is used in Django. Its objective is to make it simpler to create intricate, database-driven websites. Django places an emphasis on quick development, the DRY (Don't Repeat Yourself) philosophy, and the reusability and "plug ability" of components. Everywhere, even in settings, files, and data models, Python is employed. The application of technology to the job hunt has benefited both skilled individuals and those seeking skilled workers in significant ways. The accessibility of all job-hunting websites really aids skilled individuals in their daily lives. The article provides an example of a website that allows talented individuals to upgrade their abilities and employers to find skilled labor via the same online resource. The Django Framework is used to build the project, and Python, Jinja2, and SQLite are used for backend development. In the frontend, HTML, CSS, and JavaScript are used. The project created is really effective, user-friendly, and straightforward.

3. SYSTEM REQUIREMENTS

3.1. Hardware Requirements

Any software must have hardware in order for it to exist and function properly. The size and specifications of the hardware are crucial for running the software. The following list of minimum hardware needs is provided:

➤ RAM: 4 GB;
➤ Intel CORE i3 processor
➤ Minimum disk space of 256 GB

3.2. Software Requirements

➤ System of operation (Windows, MacOS).
➤ JavaScript, HTML, CSS, Python, and Bootstrap.
➤ Django Framework and the SQLite database (which is included with Django by default).
➤ An internet browser (such as Microsoft Edge or Google Chrome).
➤ Code Editor (PyCharm, Visual Studio Code).
➤ To install and manage software packages, use the package manager PIP (pip is a Python package management system).

3.3. Django Framework

High-level Python web framework Django promotes quick development and streamlined, practical design. It was created by seasoned programmers and handles a lot of the hassle associated with web development, freeing you up to concentrate on building your app

without having to invent the wheel. It is open source and free.

3.3.1. Characteristics of Django Framework

➢ Django was created to make it as simple as possible for developers to create applications from scratch.

➢ It comes with a ton of goodies you can utilize for typical web development tasks. User authentication, content management, site mapping, RSS feeds, and many other duties are all handled by Django out of the box.

➢ It prioritizes security and aids programmers in avoiding numerous security blunders, including SQL injection, cross-site scripting, cross-site request forgery, and click jacking. To manage user accounts and passwords securely, it offers a user authentication mechanism.

➢ The capacity of Django to swiftly and flexibly scale to meet the highest traffic needs is used by some of the busiest websites on the planet. Building everything from social networks to scientific computing platforms to content management systems has been done by businesses, organizations, and governments using Django.

4. Proposed System

The website, which is intended to serve as an online retail mall, is divided into front-end and back-end components. Each store owner has the ability to change and amend information in his own store thanks to this section. The back-end system can safely protect users' confidential information by providing validation checks for member and store identity. Additionally, session variables are used on every page view to thwart user-defined variables. With the help of a user-friendly method and a focus on novice web programmers, the user may easily handle his back-end data. Users have access to and control over all store data inside the back end. In addition, the back-end portion of the website uses a content management system and includes the following modules: admin panel, home, register, login, product view, cart, checkout, change password, contact us, and track order.
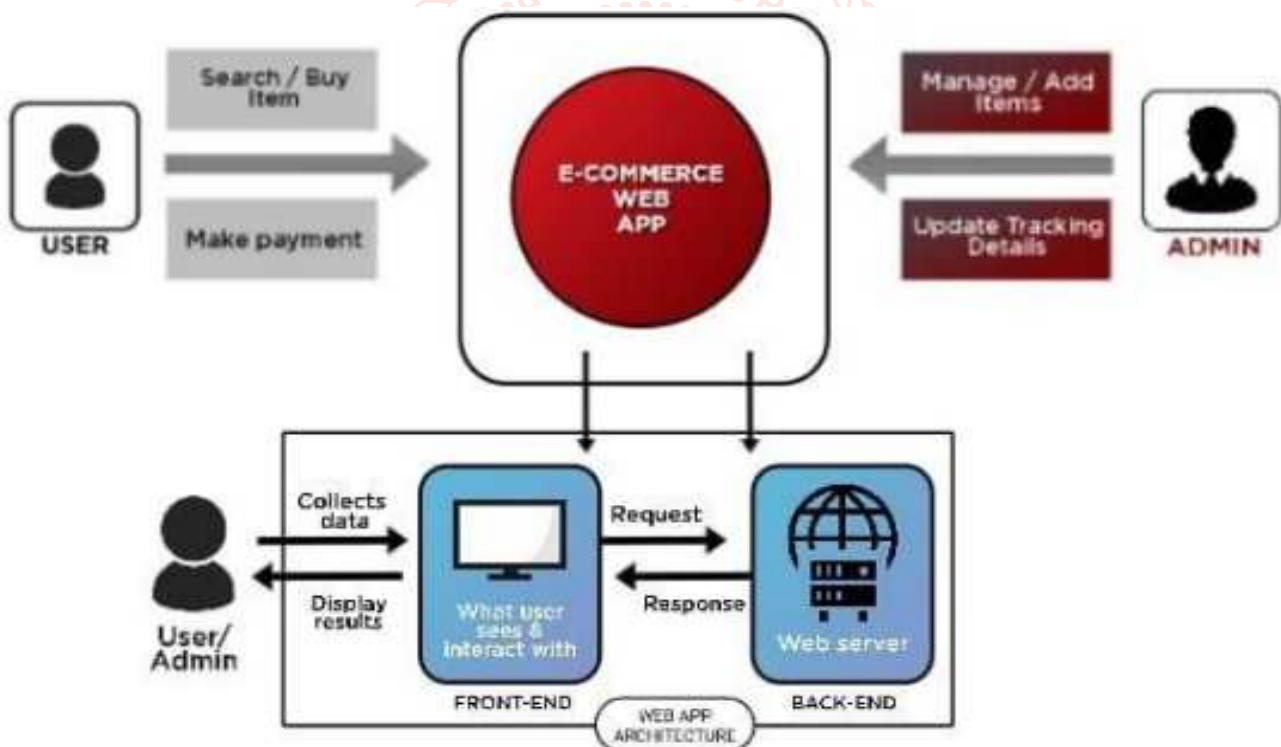

Fig 1 Web Application Architecture

4.1. Home Page / Landing page:

On the homepage of this page, each product is shown together with its image, name, and price. Additionally, two buttons are made, one for seeing the product and the other for adding the item to the shopping basket. The customers cannot add the item to their cart if they are not logged in. They only need to look at the products. Login to add the item will be written on the add to cart button. Customers can use the search function in the navigation bar to find the product they desire directly.

4.2. Register Page:

In this page, users can register themselves, in order to view the product details and place an order.

4.3. Login page:

Here, users can type their username and password to login.

4.4. Product View page:
Customers can view a certain product's essential features and reviews after clicking the view button. The user can purchase the item by clicking the add to cart button after reading the product's descriptions and reviews. The customer who purchased that particular product has the option to post a review of it for other customers to read.

4.5. Cart page:
Customers can view all the things they have added to their cart by clicking on the shopping cart symbol in the navigation bar. The quantity of the items can then be changed by the users in accordance with their needs.

4.6. Change Password page:
By selecting the "Change Password" option, all users can change their passwords.

4.7. Contact Us page:
Customers can fill out a brief form to contact us or ask questions. There are two forms, one for users who are logged in and another for people who haven't registered but still wish to contact us. If the user is already logged in, all they need to do is compose their message; otherwise, they must first provide their name, email address, and phone number.

4.8. Track Order page:
You will receive an order id after completing the necessary order. The order can also be tracked using that id. You must enter your order ID in the track order option in order to view the status of the order.

4.9. USE CASE DIAGRAM:
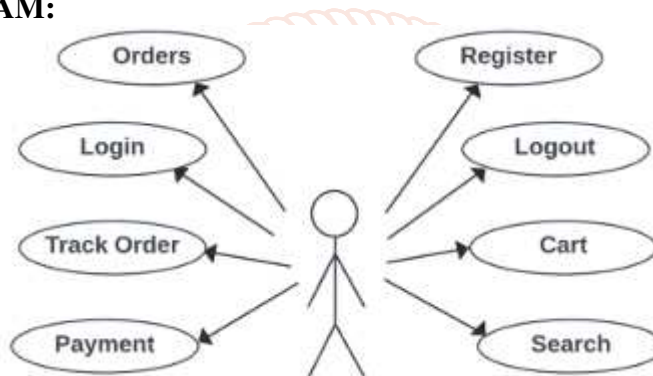
Fig 2 Customer Side
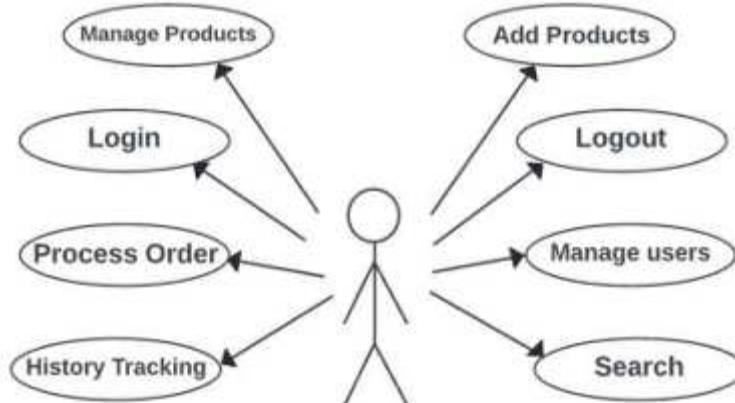
Fig 3 Admin Side

5. IMPLEMENTATION
5.1. Creating the Virtual Environment:
A virtual environment module needs to be installed on the computer after Python has been set up using Python's package manager. It is simple to run various Django versions in isolation without interfering with one another thanks to the virtual environment. Along with a few other modules required to create the application, the Django module is installed in the virtual environment with their versions specified.

This procedure is carried out as follows:
➢ Create a standard project: Select File ->> New Project to launch the IDE and start a standard project.
➢ Install Django: Next, we'll use the terminal to install the Django module. To complete this work, we'll use the PyCharm integrated terminal. Running the command python -m pip install django in cmd on a Windows computer will also install the module.

➤ Verify Django version installed: Run the python -m django -version command as displayed below to determine the Django version that is currently installed.

➤ Create Django Project: The django-admin start project command will add a Django project to the existing, standard project that we have built here. Start the Online Shopping project with django-admin.

➤ Run the default Django web server to run our applications. Django includes a default web server internally. Run server python manage.py command on terminal. The server's port number by default is 8000.

➤ Use the indicated URL to reach the webserver.

6. APPLICATION FUNCTIONALITIES

6.1. User Creation

User Creation Form, a pre-built registration form included with Django, connects to the pre-built model User. A username and password (password1 is the initial password and password2 is the password confirmation) are all that are needed for the User Creation Form, though. Create a new file called forms.py in the app directory first before customizing the pre-built form. The same directory where models.py and views.py are created also contains this new file. Then, add a field called email to a new class called New User Form by calling User Creation Form. The user should save the email. The User Creation Form can be expanded as necessary.

6.2. Search Functionality

The use of user input to search for specific data in a database is a common activity for online applications. A straightforward example of this may be categorizing a list of things. Searching with weighting, categorization, 20 highlighting, several languages, and other features may be needed for a more complicated use case. Some of the potential use cases and tools are explained in this document.

6.3. Cart Functionality

The contents of the cart are always kept in the database while using Django-SHOP. For anonymous users, the contents of the cart were maintained in the session, but for logged-in users, the content was kept in the database. The cart is currently permanently saved in the database. This method streamlines the code and conserves some random-access memory, but it also introduces a small issue: Technically speaking, the cart and the checkout page are the same. They might both be on different pages or combined on one. We won't go into more depth here because what we would often refer to as the "Checkout Page" is simply a collection of Cascade Plugins.

6.4. Order Functionality

The "Place Order" button must be clicked by the customer at a specific point during the checkout process. This process completes a number of tasks, including: Converting the shopping cart's contents into an order is one of them. Resetting the cart, or removing its contents, is the last step. This action is irreversible and atomic.

6.5. Change Password Functionality

On the user model, Django only stores hashes rather than raw (clear text) passwords; for further information, check the instructions on password management. As a result, avoid making direct manipulations to the user's password attribute. For this reason, while creating a user, a helper function is used. There are various ways to modify a user's password: manage.py Change a user's password from the command line with change password *username*.

➤ It prompts you to change the password of a given user which you must enter twice.

➤ If they both match, the new password will be changed immediately.

➤ If you do not supply a user, the command will attempt to change the password whose username matches the current system user.

6.6. Contact Us Functionality

A frequent component of many websites is a contact form, which gives visitors a method to contact the site's administrators without having to check their email or pick up the phone. A contact form can be used in a Python Django application to store a user's contact information in the website's database.

7. RESULTS AND PERFORMANCE ANALYSIS

7.1. ADMINISTRATION PANEL

The website administrator may add a product by entering the product name, price, and image. He may then save the entry, after which the product will appear on the website. The SQLite default database for Django contains tables with these product data.
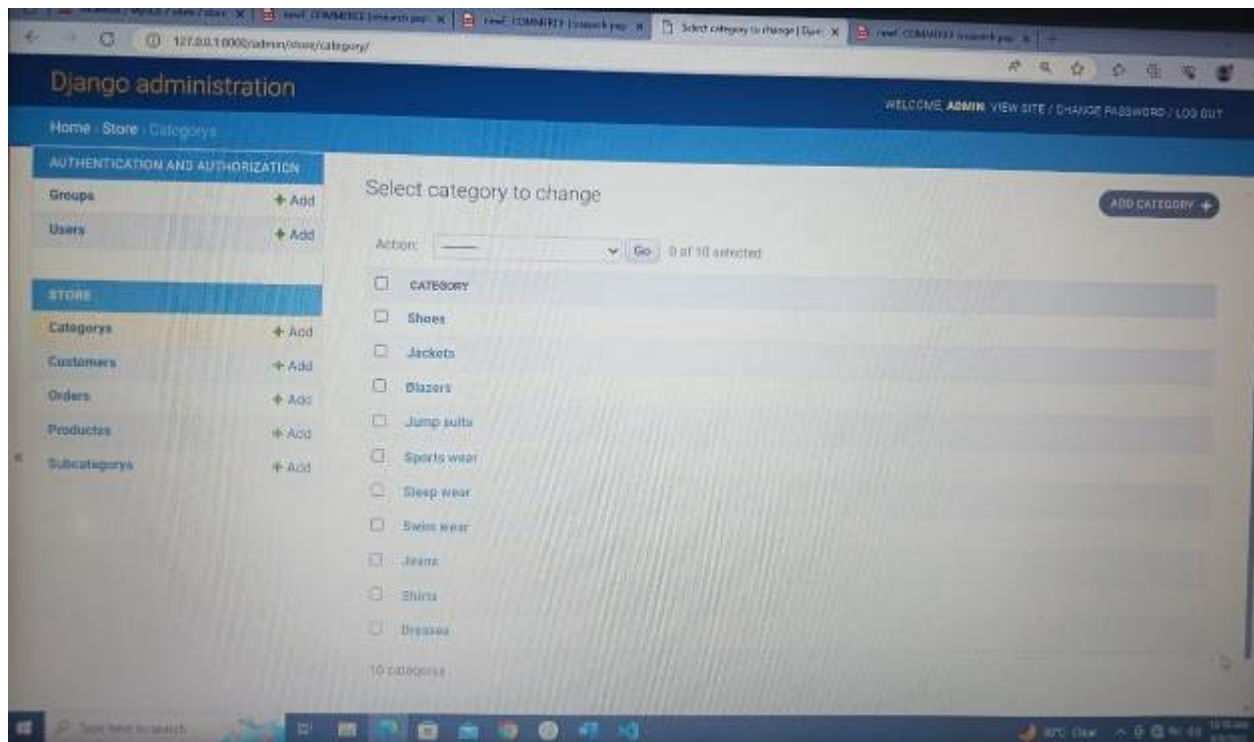
Fig 4 Add product feature in Django Administration panel

7.2. HOME PAGE BEFORE LOGIN

All of the goods, a navigation bar with search functionality, and a footer at the bottom are correctly displayed on the main page. You must sign in as a customer before making a transaction. Click register if you don't have an account. After successfully displaying the user registration form fields and a URL leading to the login page, it will redirect to the register page. Users can successfully access the login page and enter their username and password.
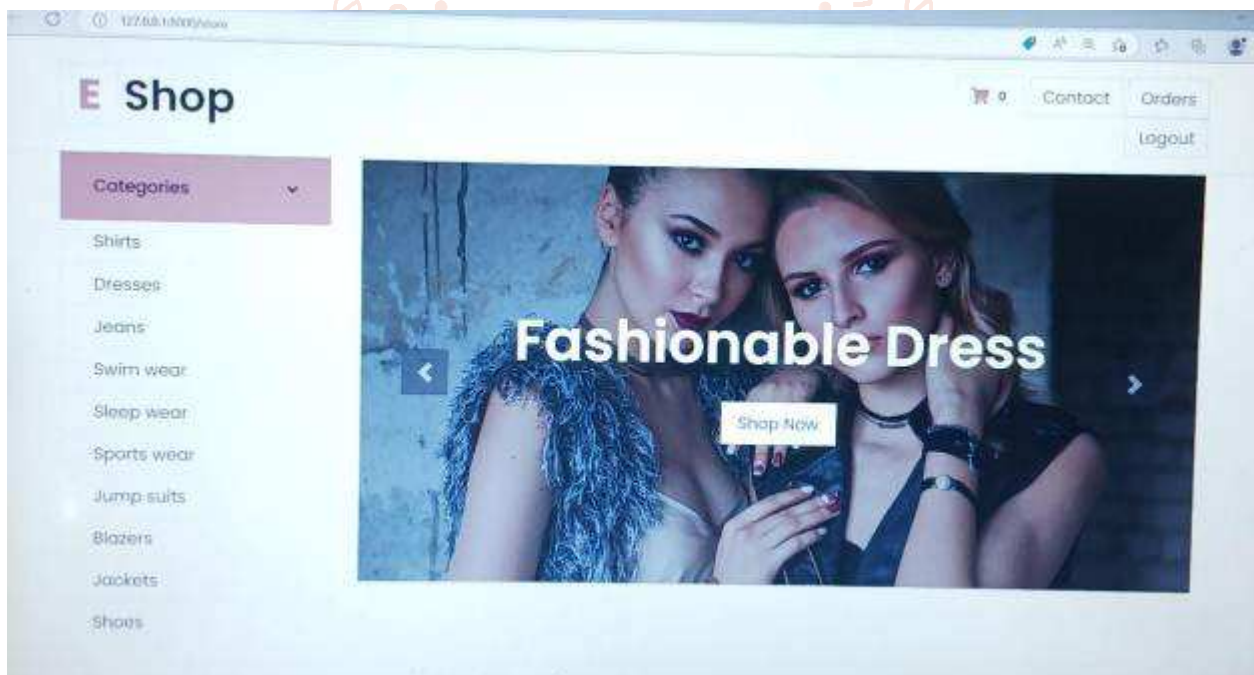

Fig 5 Home page with added products

8. CONCLUSION

As technology advances, e-commerce is advancing and becoming increasingly significant to business. This is something that should be utilized and put into practice. This e-commerce platform is made to offer a web-based application that would simplify the process of searching for, browsing, and choosing a product.

The search engine allows for interactive product searches, and the results are tailored to the user's preferences. The user may then read the whole specifications and choose the products. After adding the products to their shopping basket, they can check out by entering their address information and choosing a payment method. The orders can be checked by the administrator. The consumer can still

use the order ID to view the status of their orders on the Track Us page, though. With the help of this platform, businesses will have more chances to prosper and progress, and buyers and sellers will have more possibilities.

9. FUTURE WORKS
➢ It is necessary to implement separate invoices in addition to order summary information.

➢ Customization of user profiles should be added.

➢ Customers must be notified via emails when there are new products or special deals.

➢ All products should be classified; this should be done.

➢ Language options are necessary to make it simple for users and consumers who do not speak English to shop.

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